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04/14/08

GLONASS FULLY OPERATIONAL IN 2010

Tass, 14 April 2008

MOSCOW--Russia's Global Navigation Satellite System, or GLONASS, is expected to be fully operational in 2010, one year later than previously planned, Anatoly Perminov, head of Russia's Federal Space Agency, said at a briefing on April 12.

"One year later than planned, in 2010, GLONASS will become fully operational and will work with high precision and efficiency," Perminov said. The GLONASS system currently consists of 16 satellites, with a planned total of 30 satellites. Unlike the widely used American GPS system, GLONASS does not yet provide global coverage.

GPS COMPETITION CLOSING IN

The Strategy Page, 13 April

London--The success of the U.S. GPS satellite navigation system has generated lots of competition. But so far, these other efforts have had rough going. A European consortium is going forward with its own version of GPS, called Galileo, despite growing costs and technical problems. Initially, Galileo was to be funded with private money. But the costs climbed beyond the most optimistic estimates of future income, so now Galileo will be paid for by tax dollars, as was GPS, and the competing Russian and Chinese systems.

So far, only one Galileo satellite has been launched, simply for research, although the original plan called for four to be up there by now, to provide a sufficient number of birds for a test system. As it is, a second test satellite is to be launched this month. Originally, all 30 satellites were to be up by this year, but now the target date is 2014. China has offered to invest in Galileo, and the Europeans are happy to have the help. Galileo will cost over \$11 billion when completed, and the fifteen nations of the European Space Agency (ESA) have put in several hundred million dollars already. This however, is more than twice what the system was originally expected to cost.

Galileo came about because the Europeans didn't like being dependent on an American system, and don't believe the Russians will be able to keep their GLONASS system viable. If Galileo becomes operational, the European nations will pay for it, but anyone can use it. Dual signal (GPS and Galileo) receivers won't cost much more (maybe 20 percent more) than GPS receivers do. Having two separate sets of signals makes for more reliable and accurate receivers. Also, the way Galileo is being set up, it will provide improved reliability in higher latitudes and in built up areas.

Russia's answer to GPS, GLONASS, was at full strength (24 satellites) shortly after the Cold War ended (1995). But the end of the Cold War meant the end of the regular financing for GLONASS. Maintaining the system meant launching replacement satellites every 5-7 years. By the end of 2002, only seven GLONASS birds were still operational. However, a series of launches in 2003 increased the number of active satellites to twelve, and that went to 18 by the end of 2007.

Russia plans to put eight more GLONASS satellites in orbit this year. That would expand the system to 24 navigation satellites. Russia plans to have the system fully operational next year. Right now, it is active for most of Russia. With 24 birds, it will cover the globe and be a competitor for GPS.

The money for GLONASS is coming from a Russian government that does not want to be dependent on the American Department of Defense controlled GPS system. But the money is only there because of high oil prices. Most GLONASS receivers in use are actually combined GPS/GLONASS receivers. Russia will have to put billions of dollars into GLONASS over the next few years to get the system fully operational, and then spend even more money to maintain the satellite network.

China has a satellite navigation system called BeiDou. Think of this system as GPS light. BeiDou only covers East Asia, and not even all of China. But it covers the areas along the coast, and Taiwan. The BeiDou system is less accurate than GPS, slower, but it does allow two way traffic. This is useful for sending short messages (up to 120 Chinese characters so, about a hundred words). Sort of IM (Instant Messaging) class stuff.

The system can only handle a few hundred thousand users, but that would be sufficient for the number of Chinese troops involved in any major operation. BeiDou also suffers some reliability problems, and is apparently very vulnerable to jamming and spoofing. Because of all that, it is believed that BeiDou is just a first generation system. A training system, one where China learns the ins and outs of building satellite navigation systems. No one has found a way to make a buck off a network of navigation satellites. At least not directly There are plenty of ideas, but no one has yet turned any of those ideas into cash.

PRIVATE SECTOR CAN'T DO IT ALL

Stockton (CA) Record, 14 April 2008

DARPA celebrated its birthday this week. Never heard of it? If you have ever used the Internet or a Global Positioning System, you should be celebrating this government agency's birthday. The Defense Advanced Research Projects Agency was established in 1958 as a U.S. response to the Soviet Union's launch of the Sputnik satellite.

The agency, originally named ARPA, has played a major role in funding and supporting some of the most significant developments of the computer and information technology era. A government agency being innovative and visionary?

DARPA is unusual in that it was set up outside the normal Defense Department structure. Technical employees can work for DARPA only three to five years, thus ensuring a steady supply of new ideas. According to its founding documents, "DARPA was designed to be an anathema to the conventional military and R&D structure and, in fact, to be a deliberate counterpoint to traditional thinking and approaches."

Its major accomplishments include ARPANET, which was the first network that allowed communications among many computers, the precursor to the Internet; and Transit, which led to the development of GPS.

The accomplishments of this small government agency and its unusual structure are significant to consider 50 years later as we evaluate the presidential candidates' views on the role of government, and as we face daunting challenges of a declining economy, inadequate health care and education, and global problems such as terrorism and climate change.

Confidence in the federal government's ability to solve some of these problems is at an all-time low. Instead, many in America now look to the private sector and nongovernmental organizations for solutions. We need to think carefully about what role we want government agencies to play in developing solutions for our many challenges. Can the private sector and nongovernmental organizations reduce poverty, ensure that our children have access to health care and safe, less-crowded classrooms and protect our environment?

Can the private sector regulate itself so cars and toys are safe, and so pollution is reduced without government involvement? The mortgage crisis is a reminder of the need for government regulation. The world is far more complicated than it was 50 years ago when DARPA was established. Yet its success gives an example of how government agencies succeed: by not building entrenched bureaucracies, by having strategic plans that are monitored and evaluated regularly, and by being transparent and accountable to the taxpayers who pay the bills.

Rwanda requires elected officials and government ministers to set measurable goals and to sign performance contracts. Why can't we do this in the U.S.? In a presidential race focused on personality, gender, race and age rather than policies and solutions, we might end up again with a president who fails to meet the domestic and global challenges of our time.

USAF CONCERNED ABOUT HOLES IN SPACE DEFENSE

Colorado Springs Gazette, 14 April 2008

Air Force planners are readying for America's first space war, but "Battlestar Galactica" it isn't. There won't be star fighters, light sabers or cool talking robots. Instead there will be men and women in cubicles at bases in Colorado Springs going mouse to mouse with enemies.

Defending satellites means protecting key components of warfare, from navigation and communication to intelligence gathered by camera-carrying spy satellite. That means the people working on computers will have to maneuver the satellites in orbit and make adjustments to avoid jamming and other threats.

They'll also be battling foreign hackers who will try to take out satellites by corrupting computers on the ground, planners predict. The threat to space was the top topic at last week's National Space Symposium in Colorado Springs, and Air Force leaders didn't miss an opportunity to share their fears. "The view that space is contested is playing a bigger role in war games," said Col. Joe Squatrino, who oversees space defense programs for Air Force Space Command in Colorado Springs.

The most common worry among Air Force commanders is that enemies will block navigation signals from Global Positioning System satellites. That would leave the Army lost and Air Force bombs off-target. And it's apparently easier than ever. **"GPS is a really weak signal," said Lt. Col. Stormy Martin, who oversees navigation programs at Space Command.**

Because the signal is so weak after its 12,000-mile trip from a satellite to the earth's surface, it can be jammed with pocket-sized transmitters that broadcast fuzzy signals, which can block out the vaunted American navigation system. And those pocket-size rigs are easy to come by. A quick Internet search yields scores of companies selling mostly Chinese-built jamming rigs.

The Air Force solution for the future, Martin said, is switching over to a dedicated military signal that will be harder for would-be jammers to identify and pumping up the volume of the GPS signal so it will be heard by receivers like a politician barking his message over the protests of an angry crowd.

That will cost big money, though. The Air Force spent about \$1 billion on development of navigation satellites over the past two years and wants another \$800 million in development money in 2009.

Another fear is satellites getting destroyed in space in a future war. The Chinese and Americans have demonstrated this capability on their satellites in the past two years. But it's not as cool as it sounds. While some may picture a laser zapping a satellite into bits, followed by Death Star-like explosion, the systems in use now are the orbital equivalent of hitting a clock radio with a mallet. Satellites aren't built like battleships, Squatrino said. Almost anything sent flying their direction, from a \$1 million warhead to a \$5 baseball, will do damage.

Work is ongoing to design better-protected satellites that can survive electronic attacks or dodge a warhead. But building a tougher satellite isn't a great option, because armoring spacecraft would mean sending tons of extra metal into orbit every year, costing millions. Col. Shawn Barnes at Space Command is trying to keep American satellites safe by figuring out what objects in orbit could hammer them to bits. "You have hostile and nonhostile threats," Barnes said, noting that space junk and warheads can have the same devastating effect.

To figure out what threats are there, Barnes is trying to use earthbased telescopes and radars along with a space-observing spy satellite that's in development to look at everything in the sky. The tab for the spy satellite could top \$824 million. No matter how much experts know about what's in orbit, however, a few American satellites could easily be smashed by a determined enemy, planners say.

That's where Lt. Col. Jim Nugent comes in. He oversees "operationally responsive space" for the command. The job entails finding cheaper ways to launch cheap satellites that could serve as orbiting Band-Aids in case of war. Top leaders say there's an urgency to the space defense effort at the command. "The evidence is clear that we are being challenged in terms of use of our space capabilities," said Gen. Bob Kehler, who leads Space Command.

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"GPS III...SOONER...NOT LATER"